

## Disappearance of Gases Around the Poles 85

inches in length and three-fourths of an inch in diameter, had two platina poles fixed into its upper, hermetically sealed, extremity: the poles, where they passed through the glass, were of wire; but terminated below in plates, which were soldered to the wires with gold (fig. 16). The tube was filled with dilute sulphuric acid, and inverted in a cup of the same fluid; a voltaic battery was connected with the two wires, and sufficient oxygen and hydrogen evolved to occupy four-fifths of the tube, or by the graduation, 116 parts. On separating the tube from the voltaic battery the volume of gas immediately began to diminish, and in about five hours only 13<sup>1</sup> parts remained, and these ultimately disappeared.

Fig. 16. 303. It was found by various experiments that this effect was not due to the escape or solution of the gas, nor to recombination of the oxygen or hydrogen in consequence of any peculiar condition *they* might be supposed to possess under the circumstances; but to be occasioned by the action of one or both of the poles within the tube upon the gas around them.

On disuniting the poles from the pile after they had acted upon dilute sulphuric acid, and introducing them into separate tubes containing mixed oxygen and hydrogen, it was found that the *positive* pole effected the union of the gases, but the negative pole apparently not (324). It was ascertained also that no action of a sensible kind took place between the positive pole with oxygen or hydrogen alone.

304. These experiments reduced the phenomena to the consequence of a power possessed by the platina, after it had been the positive pole of a voltaic pile, of causing the combination of oxygen and hydrogen at common, or even at low, temperatures.

This effect is, as far as I am aware, altogether new, and was immediately followed out to ascertain whether it was really of an electric nature, and how far it would interfere with the determination of the quantities evolved

in the cases of electro-chemical decomposition.  
305. Several platina plates were prepared (fig. 17). They were nearly half an inch wide, and two inches and a half long: some were  $\frac{1}{16}$  inch of an inch, others not more than  $\frac{1}{32}$  inch, whilst some were as much as  $\frac{1}{4}$  inch in thickness. Each had a piece of platina wire, about seven inches long, soldered to